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APPENDIX F

SALZMANN EVALUATION METHOD

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Am. J. Orthodontics
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The teeth in malocclusion are assessed according to the criteria and the weights or point values assigned to them. The relative point values are based on clinical orthodontic experience from the standpoint of the usual contributory effects of various types of malocclusion on dental health, function, and esthetics.

The point values of the Handicapping Malocclusion Assessment Record forms were tested by orthodontists from various parts of the United States. They assessed dental casts of patients with untreated malocclusion of various degrees of severity. The scores obtained were found to show an extremely high correlation with subjective clinical ratings of severity of malocclusion of the same casts.

INSTRUCTIONS FOR SCORING

The assessor should score 2 points for each affected maxillary incisor and 1 point for each affected maxillary posterior tooth and for each affected mandibular anterior and posterior tooth.

Fig. 3 shows the division of the dentition for scoring. The maxillary anterior segment includes the four incisors only. Two points should be scored for each deviated maxillary incisor and 2 points for each *visible crest* of the interdental papilla of spaced maxillary teeth from canine to canine.

The mandibular anterior segment also includes the four incisors, for which only 1 point is scored for each deviated incisor tooth and 1 point for each *visible*

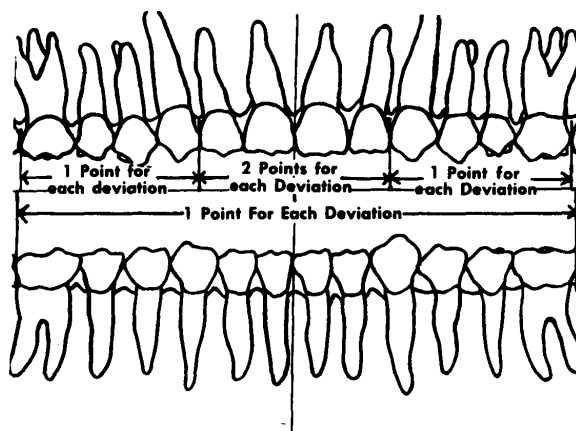


Fig. 3. Division of dentition for scoring. The anterior sections include the four incisors only. The posterior sections include the canines, first and second premolars, and first molars. The second molars may be used when the first molars are missing; otherwise, they are not included in the assessment. Score 2 points for each deviated maxillary incisor. Score 2 points for each visible crest of a maxillary incisor papilla. Score 1 point for each maxillary posterior tooth deviation. Score 1 point for each deviated mandibular anterior and posterior tooth. Score 1 point for each visible crest of a papilla of spaced mandibular incisors and for each spaced posterior tooth when both its mesial and distal papillae crests are visible.

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crest of the interdental papilla from canine to canine when the incisors are spaced.

The posterior segments in the maxilla and in the mandible include the canines, first and second premolars, and first molars. One point only is scored for each posterior tooth deviation and for each spaced posterior tooth (not papilla) when both the crests of the mesial and distal interdental papillae are visible.

When the maxillary anterior score under A (intra-arch deviation) plus the score of the anterior segment under B (interarch deviation) (Fig. 2) equals 6 points or more, 8 additional points are added to the grand total score to denote the presence of an esthetic handicap.

INTRA-ARCH DEVIATION. *Intra-arch deviation* assessment is made by placing the casts, teeth upward, in direct view of the assessor (Fig. 4). The number of teeth affected is recorded as indicated on the Handicapping Malocclusion Assessment Record form. When a series of assessments is made, the score can be computed at a later time.

Missing anterior (Fig. 4, A) and *posterior teeth* (Fig. 4, C) are assessed by

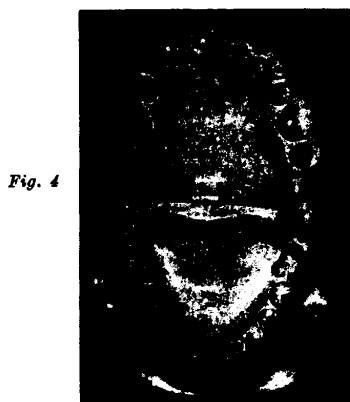


Fig. 4

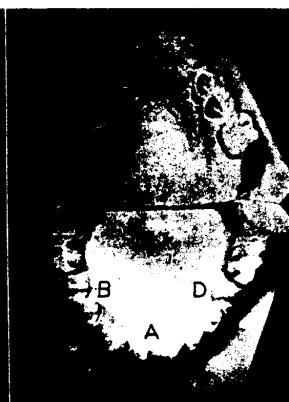


Fig. 5

Fig. 4. Method of placing casts for intra-arch assessment. A, Missing anterior teeth. B, Open anterior space between maxillary central incisor teeth. Score 2 points for the papilla here visible. C, Missing posterior tooth. D, The right and left maxillary first premolars are spaced on their mesial and distal sides. Score 1 point for each premolar (posterior teeth), not the spaces.

Fig. 5. Crowded anterior and posterior teeth. A, The mandibular incisors are crowded; score 1 point for each tooth. B, The mandibular right second premolar is crowded; score 1 point for this posterior tooth. C, The maxillary right and left lateral incisor teeth are scored as rotated because they can be aligned without moving other teeth in the arch; score 2 points for each rotated incisor. D, The mandibular left second premolar is rotated (*see text*); score 1 point for this posterior tooth. E, The maxillary right canine is scored for closed space because it does not have sufficient space for erupting; score 1 point for the canine. F, The maxillary left canine space does not show the canine through the alveolar crest and is scored as missing; score 1 point for this missing posterior tooth.

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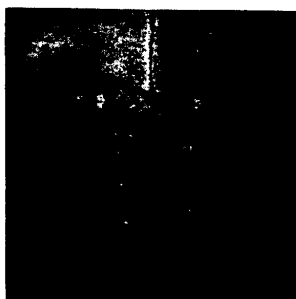


Fig. 6. Closed spacing of anterior teeth. Space is not sufficient for the lateral incisors to erupt into normal alignment without moving other teeth in the arch.

actual count. An unerupted tooth, a severely carious nonfunctioning tooth, or a tooth with only the roots remaining is recorded as missing.

Crowded anterior (Fig. 5, A) and posterior teeth (Fig. 5, B) refers to positional irregularities of the tooth crowns that interrupt the continuity of the arc of the dental arch and the space is insufficient for tooth alignment without moving adjacent teeth in the same arch. A tooth recorded as crowded is not recorded also as rotated.

Rotated anterior teeth (Fig. 5, C) refers to positional irregularities of tooth crowns that interrupt the continuity of the arc of the dental arch, but there is sufficient space for tooth alignment without the necessity of moving adjacent teeth in the arch. A tooth recorded as rotated is not recorded also as crowded.

Rotated posterior teeth (Fig. 5, D) refers to irregularities of tooth crowns that interrupt the continuity of the arc of the dental arch; all or part of the lingual or buccal surface faces some part of the adjacent proximal tooth surfaces; there is sufficient space for tooth alignment without moving adjacent or other teeth in the arch. A tooth recorded as rotated is not recorded also as crowded.

Open spacing of anterior teeth (Fig. 4, B) refers to incisor tooth separation that exposes to view the crest of the interdental papillae. One should record the number of papillae visible from mesial of canine to mesial of canine (not the teeth).

Closed spacing of anterior teeth (Fig. 6) refers to space closure that will not permit a partially erupted tooth to complete its eruption without moving adjacent or other teeth in the same arch. The number of teeth affected should be recorded. A tooth recorded as showing closed spacing is not recorded also as rotated or crowded. A missing or unerupted tooth with closed space is recorded as missing only.

Open spacing of posterior teeth (Fig. 4, D) refers to interproximal tooth separation that exposes to view the crests of the adjacent mesial and distal interdental papillae of a tooth. The assessor should record the number of posterior teeth affected (not the papillae).

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Fig. 7. See text for assessment.

Closed spacing of posterior teeth refers to space closure that will not permit a partially erupted tooth to complete its eruption without moving other teeth in the same arch. A tooth recorded under closed spacing is not recorded also as rotated or crowded (Fig. 5, *E*). A missing or unerupted tooth with closed space is recorded as missing only (Fig. 5, *F*).

In the casts shown in Fig. 7 the maxillary right central incisor is missing. The other three maxillary incisor teeth are spaced. Although it is obvious that the right central incisor, if it were present, also would be spaced, only three papillae are scored and not those adjacent to the missing incisor. Therefore, the anterior score is 2 points for the missing central incisor and 2 points for each of the three visible papillae, making a total score of 8 points for the intra-arch assessment of the maxillary anterior segment. This is sufficient to warrant the addition of 8 more points to the total score to denote an esthetic handicap.

The maxillary canine teeth (Fig. 7) are spaced on both mesial and distal sides. Since the canine teeth are counted with the posterior segment in this assessment, a score of 1 point is added for each spaced canine tooth (not the papillae). This makes a total of 10 points, plus 8 points for esthetic handicap, or a total of 18 points, even before the interarch deviations are assessed.

The maxillary first premolars are spaced on the mesial sides only. Posterior teeth, to be counted as spaced, must show visible crests of the papillae on their mesial and distal sides. Therefore, these teeth are not scored as spaced. In the mandibular dental arch there is a space on each side of the arch between the canine and the first premolar. Since there are no spaces on the distal sides of the first premolars, these likewise are not scored as spaced. Fig. 8 shows the method of assessing the casts discussed in Fig. 7.

INTERARCH DEVIATION. The casts are approximated in terminal occlusion (Fig. 9) as indicated by a wax bite trimmed so as not to extend beyond the buccal

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DEPARTMENT OF MEDICAL ASSISTANCE SERVICES

DEFINITION AND CRITERIA FOR ASSESSING HANDICAPPING MALOCCLUSION

PERMANENT DENTITION

HANDICAPPING MALOCCLUSION ASSESSMENT RECORD

PROVIDER I.D.# **SAMPLE**

RECIPIENT I.D.# _____

A. INTRA-ARCH DEVIATION

SCORE TEETH AFFECTED ONLY		MISSING	CROWDED	ROTATED	Spacing No.		NO.	POINT VALUE	SCORE
					OPEN	CLOSED			
MAXILLA	Ant.	17	18	19	20	21		X2	
	Post.	22	23	24	25	26		X1	
MANDIBLE	Ant.	27	28	29	30	31		X1	
	Post.	32	33	34	35	36		X1	
TOTAL SCORE									

Ant. = anterior teeth (4 incisors); Post = posterior teeth
(include canine, premolars and first molars).
No. = number of teeth affected.

B. INTER-ARCH DEVIATION

1. Anterior Segment

SCORE MAXILLARY TEETH AFFECTED ONLY EXCEPT OVERBITE*	OVERJET	OVERBITE	CROSSBITE	OPENBITE	NO.	P.V.	SCORE
	37	38	39	40		X2	
TOTAL SCORE							

*Score maxillary or mandibular incisors.
No. = number of teeth affected; P.V. = point value.

2. Posterior Segment

SCORE TEETH AFFECTED ONLY	RELATED MANDIBULAR TO MAXILLARY TEETH				SCORE AFFECTED MAXILLARY TEETH ONLY				NO.	P.V.	SCORE	
	DISTAL		MESIAL		CROSSBITE		OPENBITE					
	Right	Left	Right	Left	Right	Left	Right	Left				
Canine	41	45	49	53	57	61	65	69		X1		
1st Premolar	42	46	50	54	58	62	66	70		X1		
2nd Premolar	43	47	51	55	59	63	67	71		X1		
1st Molar	44	48	52	56	60	64	68	72		X1		
No. = number; P.V. = point value;											TOTAL SCORE	
*P.V. for surgical criteria											GRAND TOTAL	

No. = number; P.V. = point value;
*P.V. for surgical criteria

Date of Evaluation: _____
Consultant Signature: _____

Remarks:

Prepared by Dr. J. A. Salzmann, approved by the Board of Directors of the American Association of
Orthodontists and the Council on Dental Health of the American Dental Association.

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and labial surfaces of the occluded teeth. Each side to be assessed is held in direct view by the assessor.

Overjet (Fig. 10) refers to labial position or labio-axial inclination of the maxillary incisors in relation to the mandibular incisors, permitting the latter to occlude on or over the palatal mucosa.

Overbite refers to the occlusion of the maxillary incisors on or opposite the



Fig. 9. Method of occluding casts for interarch assessment.

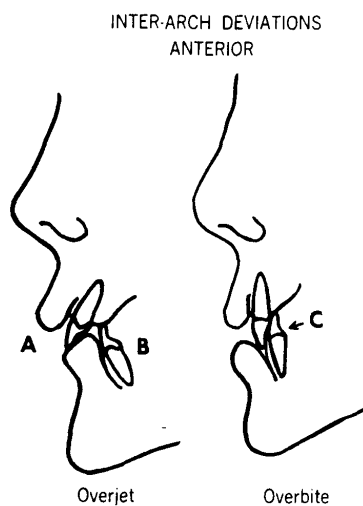


Fig. 10. Interarch deviations, anterior. Overjet is shown by the labio-axial inclination of the maxillary incisors. The mandibular incisors occlude on the palatal mucosa. Therefore, both overjet and overbite are scored for each tooth. In overbite shown here, mandibular incisors occlude on palatal mucosa. Maxillary incisors are not in overjet but extend to the labiogingival margin of the mandibular incisors. Score 2 points for each incisor tooth in overbite only.

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labial gingival mucosa of the mandibular incisors, or the mandibular incisors occlude directly on the palatal mucosa back of the maxillary incisors (Fig. 10).

Overjet and overbite (Fig. 10) is scored when the mandibular teeth occlude directly on the palatal mucosa while the maxillary incisor crowns are labially inclined and in overjet. In such cases, both overjet and overbite are scored for the same case.

Cross-bite of the incisors (Fig. 11, A) refers to maxillary incisors that are in lingual relation to their opposing teeth in the mandible when the maxillary and mandibular dental arches are in terminal occlusion.

Cross-bite of posterior teeth (Fig. 11, B) refers to teeth in the buccal segment that are positioned lingually or buccally out of entire occlusal contact with the teeth in the opposing jaw when the rest of the teeth in the dental arches are in terminal occlusion. When anteroposterior deviation is present in addition to cross-bite, both are scored.

Open-bite of the incisors (Fig. 12, A) refers to vertical interarch dental separation between the maxillary and mandibular incisors when the posterior teeth are in terminal occlusion. Open-bite is recorded in addition to overjet if the incisal edges of the labially protruding maxillary incisors are above the incisal edges of the mandibular incisors when the posterior teeth are in terminal occlusion. Edge-to-edge occlusion is not assessed as open-bite.

Open-bite of posterior teeth (Fig. 12, B) refers to the vertical interdental

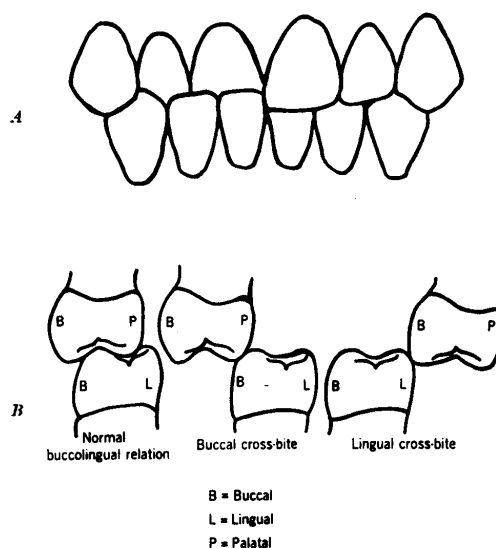


Fig. 11. Interarch deviations. A, Anterior cross-bite. B, Cross-bite of posterior teeth.

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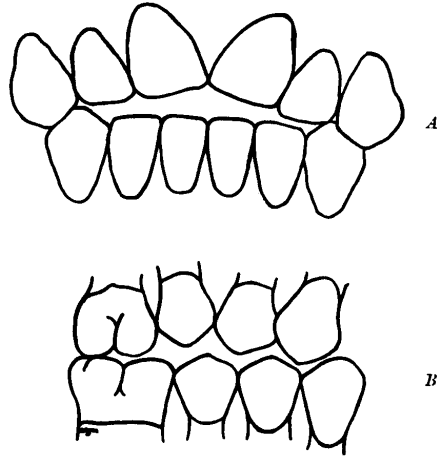


Fig. 12. Interarch deviations. A, Anterior open-bite. B, Posterior open-bite.

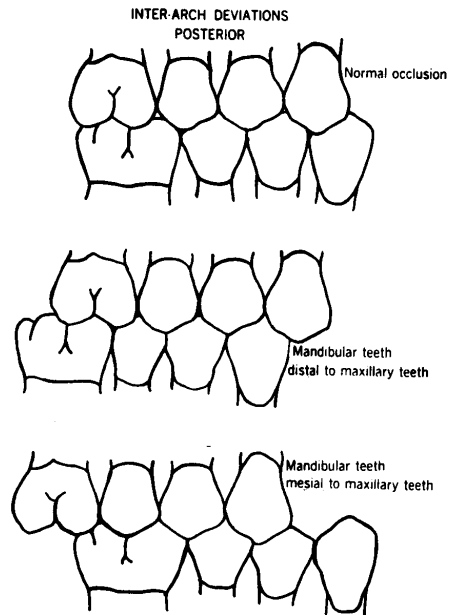


Fig. 13. Interarch deviations, posterior.

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separation between upper and lower canines, premolars, and first molars when the rest of the teeth in the dental arches are in terminal occlusion. Cusp-to-cusp occlusion is not assessed as open-bite. When open-bite is present with anteroposterior deviation or cross-bite, both are scored.

Anteroposterior deviation of posterior teeth (Fig. 13) refers to the occlusion in a forward or rearward direction to the accepted normal relation of the mandibular canine, first and second premolars, and first molar in relation to the opposing maxillary teeth. The deviation is recorded when it extends a full cusp or more for the first molars and when the premolars and canines occlude in the interproximal area mesial or distal to the accepted normal relation. One point is scored for each deviated tooth.